WHAT IS CLAIMED IS:

1. A computer implemented method for encoding a digital image, comprising:

dividing an image into one or more image kernels, each kernel having a plurality of pixels;

measuring the intensity of each pixel in a kernel;

creating a vector comprising the measured intensities for each pixel in the kernel;

storing the vector in a vocabulary comprising a plurality of vectors;

creating an index for the vector;

adding the index to a vector index file comprising a plurality of indices corresponding to the plurality of vectors in the vocabulary.

2. The method of claim 1, further comprising comparing a newly created vector with the plurality of vectors in the vocabulary to determine if a previously stored vector matches said newly created vector.

3. The method of claim 2, further comprising transforming the image from an RGB color space to a YC_RC_B color space.

4. The method of claim 3, wherein the comparison step further comprises using a closer tolerance for pixel matching of Y channel values that are substantially near the center of the intensity range.

5. The method of claim 3, wherein the creating a vector step further comprises replacing intensity measurements in the C channel fore each pixel with the difference between the pixel's measured intensity and the average C channel intensity measurement of three pixels proximal to the pixel.

6. The method of claim 2, further comprising using a previously stored vector if the comparison identifies a match between the newly created vector and a previously stored vector in the vocabulary.

7. The method of claim 2, further comprising appending the newly created vector to the vocabulary if the comparison does not identify a match between the newly created vector and a previously stored vector in the vocabulary.

8. The method of claim 2, wherein the indexing step further comprises populating the plurality of vectors in the vocabulary in a vector tree data structure.

9. The method of claim 8, wherein the comparison step further comprises comparing the newly created vector to the vector tree data structure.

10. The method of claim 8, wherein each leaf node of the vector tree data structure comprises the root of another vector tree for the next dimension in the vector.

11. The method of claim 1, further comprising acquiring the image with a line scan camera.

12. The method of claim 1, wherein the image comprises at least a portion of a microscope slide.

13. The method of claim 1, wherein a kernel comprises a rectangular region of the image.

14. The method of claim 1, wherein a vector is a one-dimensional array of scalars, wherein each scalar represents the color channel intensities for a pixel in the kernel.

15. The method of claim 1, wherein the indexing step further comprises assigning a unique 4-byte integer to a vector.

16. The method of claim 2, wherein the dividing, measuring, creating a vector, and storing steps are carried out on a client machine communicatively coupled with a server machine via a communication network.

17. The method of claim 16, wherein the creating an index, adding, and comparison steps are carried out on the server machine.

18. A computer implemented method for recognition of patterns in a digital image, comprising:

creating a vector set comprising a plurality of image characteristic vectors, the vector set corresponding to an image characteristic;

identifying a candidate region of an image, the candidate region comprising a plurality of candidate region vectors;

determining a correlation for each vector in the plurality of candidate region vectors with each image characteristic vector in the vector set; and

averaging the correlations to determine the probability that the candidate region exhibits the image characteristic.

19. The method of claim 18, wherein the determining step further comprises dividing the number of times a vector is observed in the candidate region by the number of times a vector is observed overall.

20. A system for encoding a digital image, comprising:

an image segmenter configure to divide an image into a plurality of kernels, each kernel having a plurality of pixels;

an intensity measurer configured to measure the intensity value of each pixel;

a scalar compiler configured to create a vector for each of the plurality of kernels, wherein a vector comprises the intensity value of each pixel in a kernel;

a vocabulary configured to store the plurality of vectors corresponding to the plurality of kernels;

an indexer configured to create an index for each vector in the plurality of vectors; and

a vector index file configured to store the plurality of indices, the plurality of indices corresponding to the plurality vectors.

21. The system of claim 20, further comprising a vector comparison module configured to compare a newly created vector to the plurality of vectors in the vocabulary.

22. The system of claim 21, further comprising an image decoder configured to reconstruct the image from the indices in the vector index file and the corresponding vectors in the vocabulary.

23. The system of claim 21, further comprising a microscope slide scanner for capturing the digital image.

24. The system of claim 23, wherein the microscope slide scanner comprises a line scanning sensor for capturing the digital image.

25. A system for encoding a digital image, comprising:

means for dividing an image into a plurality of kernels;

means for creating a vector for each of the plurality of kernels;

means for storing a plurality of vectors in a vocabulary, the plurality of vectors corresponding to the plurality of kernels; and

means for creating an index for each vector in the plurality of vectors;

means for storing a plurality of indices in a vector index file, the plurality of indices corresponding to the plurality vectors.